Divyat Mahajan

4th Year Undergraduate Student
Department of Mathematics, IIT Kanpur

Homepage: divyat09.github.io
Email: divyatmahajan@gmail.com
Contact: +91 7755057756

EDUCATION

Year	Degree	Institution	CPI/ %
2014-2019	B.S. in Mathematics And Scientific Computing Double Major in Computer Science And Engineering	Indian Institute of Technology Kanpur	8.5/10.0
2014	Senior Secondary Examination	St. Stephens Sn. Sec. School, Chamba, HP	89.2 %
2012	Matriculation Examination	St. Stephens Sn. Sec. School, Chamba, HP	94.7 %

AWARDS AND ACHIEVEMENTS

- Obtained overall rank **93** and rank **8** among IIT Kanpur teams in **ACM-ICPC 2017** Regionals Online Round
- Obtained **second** rank in International High Performance Computing 2016 organized by **CDAC India** and Techkriti IIT Kanpur
- Selected among 10 students to pursue **Double Major** in Computer Science and Engineering in July 2016
- Secured All India Rank 1940 in JEE-Advanced 2014 out of 150,000 students with Percentile **98.71**
- Obtained Merit with **Rank 13** in Matriculation Examination and **Rank 36** in Senior Secondary Examination
- Secured **Rank 1** in State Mathematics Olympiad organized by Children Science Congress in Himachal Pradesh

INTERNSHIPS

• National University of Singapore *May 2017-July 2017*
Summer Intern under Prof. Wynne Hsu Code

- Worked on building **Recommender System** that predicts Effectiveness and Side Effects on the usage of a Drug for a Patient
- Did **Web Crawling** to make datasets and performed Baseline Evaluations using **Matrix Factorization** algorithms
- Worked on latent feature extraction, latent feature selection and parameter tuning for the **Random Forest Regression Model**
- Implemented a **Deep Learning Model** to learn better Latent Features and perform Multi Label Classification of Side Effects
- **Additional Project**:
- Worked on extending the **Maroon System**: a system that integrates information about entities from various sources to create a entity profile and then updates the profile with time
- Developed **Web Crawlers** for Facebook and Wikipedia and merged the crawlers with the Maroon System

• New York Office, IIT Kanpur *June 2016-July 2016*
Research Track Exploration Intern under Prof. Vincent Ng Code

- Worked on predicting Stance for Tweets against a Target using machine learning algorithms, a task in **International Workshop on Semantic Evaluation 2016**
- Read research papers on **Sentiment Analysis** and **Stance Classification** and used ideas from them to develop a model for tweets that do not express opinion about the main target
- Generated feature vectors using **Bag of Words** approach and used **Pointwise Mutual Information** to extract useful features
- Used **Support Vector Machine** for classification of tweets in the model and implemented the model using python

ACADEMIC PROJECTS

• Ongoing Projects *January 2018 - Present*

- Undergradute Project under Dr. Vinay Namboodiri on the topic Visual Program Syntheis using Deep Learning
- Course Project for Natural Language Processing on Affect in Tweets, a task in SemEval 2018

• Probabilistic Approach to Sense Embeddings *September 2017-November 2017*
Course Project: Probabilistic Machine Learning, Dr. Piyush Rai

- Worked on Probabilistic Word Vector generation using **Gaussian Mixture Model** as suggested in the paper **Multimodal Word Distributions, Athiwaratkun and Wilson**
- Developed two models which have reduced number of parameters as compared to the model suggested in the paper by using a linear combination of global parameters to generate local word specific parameters
- Implemented the models using **TensorFlow** and obtained competing results with the model of Athiwaratkun and Wilson

• Human Emotion Recognition from Images *September 2016-November 2016*
Course Project: Machine Learning Techinques, Dr. Piyush Rai Report

- Classified the emotion from facial images of humans using machine learning algorithms into seven categories

· Generated features by using **Google Cloud Vision API** and using Neural Network in the second approach

· Compared the above approaches by implementing **Support Vector Machine** and **K-Nearest Neighbour** for classification

• **Analyzing the Indian General Election** *March 2017-April 2017*
Course Project: Multi Agent Systems, Prof. Harish Karnick Report

· Designed Preferential Voting Models with the aim to make a more democratic model than the current Indian Electoral Model

· Simulated them over the data of General Election 2014 using hypothesis made from past trends and regional sentiments

• **Polynomial Approximation of Non-Convex Functions** *March 2017-April 2017*
Course Project: Numerical Analysis and Computing, Dr. Aakash Anand Code

· Used polynomial approximation to find the global minima of the distance function of an arbitrary point from a given curve

· Implemented **Chebyshev-Proxy Root Finder** in MATLAB and determined the global minima with error in the order of 10^{-9}

• **Data Fitting Analysis for GE Distribution** *May 2016-July 2016*
Mentor: Dr. Sharmishtha Mitra Code

· Worked on data fitting analysis of 3 parameter GE distribution by fitting it to Weibull and GE distribution

· Read and implemented a research paper on estimating MLE for Weibull by using graphical method to find the shape parameter

CODING PROJECTS

• **Academics App** *May 2015-June 2015*
Mentor: Programming Club, IIT Kanpur Code

· Built an android app which gives academic data like timetable, exam schedule and course details for IIT Kanpur students

• **Backend Web Development** *August 2015-March 2016*
Role: Senior Executive Web, Techkriti 2016

· Contributed to backend part of website of Techkriti 2016, the annual technical festival of IIT Kanpur

TECHNICAL SKILLS

Programming Languages	C, C++, Python, Matlab, Verilog, MIPS, Bash
Software and Utilities	Git, Vim, Latex, Android Studio, Linux
Data Science	Sklearn, Keras, TensorFlow, Numpy, Pandas, Selenium, BeautifulSoup
Web Development	HTML, CSS, CodeIgniter, Web Scrapping(Python)

COURSEWORK AT IIT KANPUR

Machine Learning	Machine Learning Techniques, Probabilistic Machine Learning, Topics in Probabilistic Modelling* Natural Language Processing(Audit)*
Computer Science	Data Structure and Algorithm, Algorithms II, Computer Organization Theory of Computation, Compilers*, Computing Laboratory-I*
Statistics	Probability and Statistics, Applied Stochastic Process, Statistical Inference
Mathematics	Advanced Linear Algebra, Mathematical Logic, Numerical Analysis and Scientific Computing Severable Variable Calculus , Ordinary Differential Equations, Partial Differential Equations Real Analysis, Complex Analysis, Abstract Algebra

*:Current Semester

EXTRA CURRICULAR ACTIVITIES

• **Head, Publication Cell, Stamatics** *May 2017- Present*

· Leading a team of 5 members to publish next 4 editions of Newsletter Alpha over the year 2017-2018 [Alpha]

• **Senior Executive, Stamatics** *October 2016- April 2017*

· Took lead role in publishing the first edition of Newsletter Alpha, a new initiative taken by Stamatics team [Alpha]

• **Blood Connect** *February 2016-December 2016*

· Volunteer in Kanpur team of Blood Connect, largest NGO working to provide a solution for the shortage of blood in India

• **National Service Scheme** *July 2014- March 2015*

· Worked in National Service Scheme at IIT Kanpur under Professor H.C. Verma to provide better education to poor children